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USE OF PAPER-MAKING EFFLUENT FOR IRRIGATION

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USE OF PAPER-MAKING EFFLUENT FOR IRRIGATION

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INTRODUCTION

1. The Burnie Board and Timber Pty. Ltd. established a hard-board mill near Brisbane in 1957 to serve the needs of the building industry in Queensland and other Australian States. Effluent from the mill has a large organic content and the consequent high biological oxygen demand makes impractical its disposal by direct discharge into a nearby stream which is virtually stagnant for most of each year.

2. The biological oxygen demand of the effluent can be rapidly satisfied by spreading it over a relatively large area. It was therefore decided by the Company to use this method of disposal as a general practice and, at the same time, experiment with using some of the effluent to irrigate improved pastures.

QUALITY AND QUANTITY OF EFFLUENT

3. The pH of the effluent averages about 4.5 and it contains about 0.2% suspended solids and 0.6% dissolved solids, derived from the woods used in manufacture. Detailed analyses have not been made but the suspended matter is probably almost entirely fine wood fibres, lignin, and similar material while the dissolved matter would be tannins, wood sugars and the like.

4. The average effluent discharge from the mill is 400,000 to 500,000 gallons daily, delivered at a sensibly constant hourly rate throughout the day and night. A substantial part of the effluent is spread over scrub covered land near the mill and the balance is used to irrigate pastures on other mill land.

REMOVAL OF SUSPENDED MATTER

5. No special provisions are made for removing suspended matter from the effluent. However, because of the prime importance of ensuring that no effluent flows into the adjoining stream, irrigation is confined to daylight hours only and discharge during the night is stored until the following day in two earth tanks of 5 million gallons capacity. During this detention period, a considerable portion of the suspended matter settles out and some also settles in the ditches when irrigating.

AREA IRRIGATED AND METHOD OF IRRIGATION

6. Some 110 acres has been put under improved pastures and irrigated with the effluent. The surface slope on the irrigated area varies between one and seven per cent. and contour ditch irrigation was selected as being most suited to the ground conditions. Ditches, six to eight feet wide and one foot deep, have been constructed on a gradient of 0.13% with spoil from the ditch placed on the downhill side to form a low embankment. The ditches are spaced at five feet vertical intervals and intermediate spreader furrows have been provided at vertical intervals of one foot to assist in evenly spreading the effluent.

7. Outlets from the main ditches are provided every 40 feet or so. These outlets comprise a 6 in x 4 in box fabricated from four pieces of 6 in x 1 in timber with the end slotted to take a piece of galvanized iron which acts as a stop.

TYPES OF PASTURE GROWN

8. The irrigated area was originally sown with paspalum, irrigation white and Ladino clovers, H1 ryegrass, phalaris and Priebe prairie grass. Only the paspalum and clovers have survived for the full period, the paspalum predominating. Oversowing with the other species has not been attempted to date.

9. No significant response was obtained from fertilizer trials and fertilizing has not been adopted as a general practice

EFFECTS OF EFFLUENT ON SOIL AND PASTURES

10. To the present time, no deterioration of soil or pastures has become apparent, but it is too early to draw firm conclusions as to what will be the long term results. Some of the suspended matter in the effluent has found its way on to the pasture area where it tends to form a "skin" on the surface of the ground, reducing the rate of infiltration. This problem is overcome by annual chisel ploughing of the area.

11. The pastures are performing reasonably well and provide sufficient feed to fatten one beast per acre on an all year round basis. At times of flush growth, a greater number can be carried.

GENERAL COMMENTS AND CONCLUSIONS

12. Use of the paper-making effluent for irrigation has been quite successful to date, both as a means of disposing of the effluent and as a source of revenue. It is stressed, however, that the former requirement is the important one in this particular case. There is no doubt that the area of irrigated pastures could be increased but the Company feels the limited experience to date indicates it is preferable, for its purposes, to continue spreading most of the effluent on the scrub lands rather than extend the irrigated area.

13. Some additional costs in management have been introduced because of the properties of the effluent but these have not been such as to significantly limit or reduce the economic potential of the area.

14. It appears there is some scope for the use of paper-making effluent in irrigating pastures but to achieve the best results, distribution of the effluent to share-farmers on mill land or to private landholders would appear to be necessary, as the manufacturer would not usually be directly interested in livestock production beyond that needed to reduce the overall cost of effluent disposal.

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